> that the cystitis from which the patient suffers is largely due to retained urine and pus. The large proportion of the latter accounts for the albumen present.
>
> We should state here while the general character of the urine in this attack remained the same, as observed by the patient for months before this preliminary operation, there was marked amelioration in her sufferings. Only for a few moments at one time was the pain as severe as to cause swooning. The paroxysm was much shorter than usual, lasting only about two days, but the flow of mucus and pus continued the same as formerly, though diminished in quantity."

The patient's good constitution and the conservative reactions of her organism during the earlier stages of her traumatic malady, its continued and vigorous efforts for self-recovery, more frequent in ratio to the local irritation, in short, the whole picture before us confirming and elucidating the pathologic history, forbids us to attribute the decline of health or sympathetic sufferings to other than hydraulic and chemical causes, viz., the stagnation of urine retained in contact with mucous surfaces unprepared to resist its irritating salts, and whose exudations of protective mucus have but increased the mischief by accelerating putrid fermentation. To open a free passage for discharge of these morbid secretions is the first step dictated by experience towards removing their causes.

We do not exhibit the foregoing as anything more than the particular application of a general principle. Lesions apparently the same occasion different degrees of suffering in different patients. European, and especially German peasant women, may be more robust, more phlegmatic than our American women, but chemistry and mechanics are invariable. To their laws are due the fearful sufferings we have witnessed in case of spontaneous kolpokleisis, and we venture to suggest that if the luminaries of German surgery will descend from their Olympian heights, look up their kolpokleidic cases and look into them again, they will see cause to change the note of triumphant gratulation with which Prof. Simon announces his successful operations.

ART. XI.— *Traumatic Tetanus.* By CHRISTOPHER JOHNSTON, M. D., Professor of Surgery in the University of Maryland.

IN offering the notes of two cases of traumatic tetanus treated successfully by conia used hypodermically, we would not claim for that agent a specific virtue; but we desire to show the more than coincidental subsidence of tetanic symptoms under its employment, and to recall attention to the effect of conia as antagonistic, or at least antithetical, to the symptoms of tetanus. Thus the tetanic spasm of the muscles is that of rigid tonic and constant contraction, never completely yielding in intervals during its progress, and finally giving way, if ever, just previous to the fatal event, or more rarely, by far, under the influence of remedies so various and opposite, that no other than the general treatment can be definitely expressed. Conia, on the other hand, according to the authority of Christison,

> "acts on the spinal marrow, prostrates nervous power, producing paralysis of the voluntary muscles, and kills by arresting respiration. In an animal poisoned by conia the senses are preserved as long as it breathes, while the heart continues to beat even after apparent death, and its action may be maintained for a time by keeping up artificial respiration.
>
> Conia, if used in poisonous doses, produces vertigo, nausea, faintness, a sensation of numbness and muscular debility; it acts as a mydriatic, causes difficulty of speech, delirium or stupor, tremens and paralysis, and ultimately occasions convulsions and death."

More recent observers, however, express themselves at variance with the views of Christison. Thus Guttmann says that on the stomach and intestines hemlock has scarcely any influence. It may produce nausea, vomiting, and diarrhœa, but such occurrences are not common.

In a case of conia poisoning in the human subject, observed by H. Bennett, and in all the experiments of Guttmann on frogs, there was produced gradual paralysis of the voluntary muscles, and then of those of respiration. But later observers arrive at these conclusions :—

1. The paralysis is certainly not due to the action of hemlock on the muscles. 2. Neither does hemlock paralyze by its effect on the spinal cord. 3. The first action of conia is upon the terminations of the nerves, yet after a time the trunks are themselves paralyzed. But the sensory or afferent nerves remain unaffected.

Schroff states that in a short time after the poison is taken the sight is dimmed and the pupil dilated; and in Dr. Bennett's case there was total blindness, but the hearing was but little, if at all, dulled.

Finally, Dr. Sidney Ringer, from whose *Handbook of Therapeutics* we extract the above summary, remarks that this remedy is not indicated in convulsive diseases dependent upon affections of the cord, such as tetanus and strychnia poisoning, for the effects of this medicine and the diseases just mentioned are not antagonistic. Thus Guttmann strychnized frogs, poisoned them to paralysis with conia, and yet failed to check in any degree the tetanic spasms produced by the strychnia.

In this last experience Guttmann seems to be borne out by the researches of Dr. A. Crum-Brown and Dr. Thomas R. Fraser on conia and its ammonium bases. These authors are of opinion that "normal conia" should be devoid of spinal action, although the hydrochlorate of methyl-conia paralyzes the motor nerves and the spinal cord, and Morson's conia produces complete paralysis of the motor nerves before or after complete paralysis of the reflex function of the cord, according as the dose is small or large.

Before proceeding further we would call attention to the fact, in opposition to the statement of Guttmann, that the sensory nerves remain unaffected in conia poisoning, that in the first of our cases treated with conia hyperæsthesia existed during an entire month. And we find in Guttmann's paper the reason for his failure to arrest strychnia tetanus by the employment of conia in poisonous doses even. That author, as already quoted, believes that hemlock does not paralyze by its effect on the spinal cord, while Harley's experiments show that strychnia acts on all parts of the spinal cord. The inference is, therefore, conclusive, that conia is powerless before strychnia; but Guttmann's generalization with regard to "Tetanus" is manifestly inconclusive. It is true that idiopathic tetanus, the prognosis in which is for the most part favourable, resembles the tetanus of strychnia in some particulars, especially in the probable seat of its force; but there is also acute traumatic tetanus, so fatal that neither O'Beirne, nor Hennen, nor Dickson, nor Morgan, ever saw an instance of recovery from it. To this latter variety of tetanus we oppose the third conclusion of Guttmann, namely, that the first action of conia is upon the terminations of the nerves, and eventually the trunks themselves are paralyzed.

From what has preceded we have ventured the conclusion that conia may be regarded not only as an agent probably curative of acute traumatic tetanus, but also as a means of differentiation between the natures of the two chief forms of the affection.

The pathology of tetanus is still involved in great obscurity.

> "Tetanus may be an irritation of a peculiar kind affecting the excito-motory apparatus, the irritating cause being either eccentric without or centric within the spinal canal. It may be regarded as an exaltation of the polarity of the cord and medulla. Or, it may be identical with inflammation of the spinal cord and medulla oblongata."

It is, therefore, neither surprising that contra-pathic or hetero-pathic remedies should offer sufficient temptation for a trial, nor that marvellous power should be claimed for particular agents associated with the recovery of tetanic patients. When the rigid limbs relax, when the bent spine becomes limber, when the almost fixed thorax heaves in the respiratory act, when the jaws yield and the pharynx resumes its part in deglutition, it is natural—almost consequential, that to the drug, or other means directed towards a cure, should be accorded its full measure of merit as an anti-tetanic. And yet, the diversity of circumstances under which patients have recovered, has served rather to confuse than to enlighten or guide the pathologist. Of course, autopsy alone can determine the pathology of the affection.

Perhaps one reason for the variance among therapeutists is their occasional or frequent neglect to disassociate the idiopathic from the traumatic variety of tetanus. And this error, whether practical as applied to actual cases, or unpractical as appearing in the relation of cases, is fatal to progress; and is the more to be regretted when occurring among practitioners, whose contributions to pathology must necessarily be extremely sparse, the opportunities for autopsic investigation in private practice being very rare.

In connection with the successes and reverses of treatment in tetanus as influencing the direction of future attempts, it may not be amiss to advert to the great fatality which attends some forms of the affection, and the recovery that, in a certain other, almost constantly justifies the prognosis. However much improvement may be desired in the treatment of the latter form, it is especially in the former that most need exists of a clear pathology and an enlightened medication. Consequently the profession has almost exhausted its resource of tonics and relaxants in the several methods of treatment recommended.

> "Each and all have had their advocates, inasmuch as recovery has taken place after their use, and the disease has been considered to be checked in consequence."

Mr. Poland (Vol. I. of Holmes' *System of Surgery*, 2d edition) says:—

> "In the *idiopathic variety*, where it does not assume an acute and rapid form, the prognosis is, for the most part, favourable, and we may always hope for a chance of recovery.
>
> "In *sub-acute cases* of the traumatic variety, recovery does sometimes take place, and especially where there is a long interval between the injury and its accession, and where the symptoms set in mild and pursue a slow course, gradually advancing in extent and severity.
>
> "In *acute traumatic cases* the prognosis is most unfavourable, and there is scarcely a well-authenticated instance of recovery on record."

In view of this authoritative expression of accumulated experience, it is natural that interest in the acute traumatic form should have a large development, although we differ, in the premises of the third proposition, from its able writer, as regards the ratio of mortality.

With regard to the general mortality of the affection, we again quote Mr. Poland, who says:—

> "Taking all forms together, in a fair average number of cases, the proportion seems to be 7½ deaths to one recovery."

We cannot close these remarks without insisting upon the absolute necessity for constant, watchful, and intelligent nursing, whatever be the method of treatment adopted. It is impossible for a medical attendant to anticipate either the persistence or the variation of symptoms; consequently the emergencies must be met, and advantage taken of opportunities which may prove the turning points in favour of the patient. Without such care no treatment may avail, but with it some mode of practice may gain credit and life be saved. Modern medicine calls for incessant watching in most diseases. The physician or surgeon may direct, but can rarely conduct the details of management.

CASE I.—J. G., æt. 48, admitted into the hospital of the University of Maryland, February 26, 1866. Three weeks previously the patient fell from a cart, sustaining an injury of the scalp over the left frontal protuberance, laying bare the bone to the extent of three inches. He received appropriate attention but continued his work.

At the end of a week his jaw stiffened; and rigidity of the muscles of other parts appearing, he was sent to the University hospital. The jaws were then tightly locked; the facial muscles and the sterno-cleido-mastoids tonically contracted; the thorax almost fixed; respiration difficult, and also deglutition, and opisthotonic seizure seemed imminent; the pupils were contracted; general expression of the patient one of distress and anxiety. The wound had healed, but the cicatrix was wide, red, and tender. To change the condition of the scar, which might act as a persistent cause, we applied the actual cautery with decided local effect. Calling to mind the effects of *conia*, we had prepared the following solution: ℞.—Coniæ gtt. ij, acid. sulph., gtt. j, aquæ ʒj, and ordered fifteen drops of it to be injected hypodermically every two hours, day and night. Under this treatment the condition of the patient began to improve, and his muscles to relax, although by slow degrees. As he had lost several incisor teeth, nourishment could be administered readily, and was given freely during the whole course of the affection. But he still found great difficulty in deglutition, and the dyspnœa was such as to force him to maintain the sitting posture almost constantly.

March 15. Was able to open his mouth and protrude the tongue. Could swallow without difficulty, and move his head easily, and all the afflicted muscles had become softer to the touch. The eyelids moved freely, pupils resumed their normal state, and the formerly anxious countenance resumed its natural expression.

16*th*. Still improving. As he complains of the severity of the hypodermic method, his treatment was modified as follows: ℞.—Tinct. conii, ♏xx, to be taken by the mouth every four hours, alternating with the hypodermic injection, which is to be employed every four hours also, conium in some form being exhibited every two hours.

18*th*. Suspended conium treatment, as a dry throat and symptoms of poisoning appeared. Nothing was substituted.

26*th*. Has entirely recovered the control of his muscles, and is this day discharged well, having been in the hospital exactly one month.

It is worthy of mention that during the whole of this time decided hyperæsthesia of the surface existed. Before dismissing this case we would call attention to the facts that an improvement began early and steadily; although slowly continued, the conia was not pushed to the extreme of tolerance; and that symptoms of poisoning occurred then only when conium in another shape was used along with conia employed hypodermically.

CASE II.—The notes of the following case were kindly furnished me by Mr., now Dr. G. L. Wilkins, of Baltimore:—

"C. G., æt. 24; engineer; sanguine temperament. September 5th, 1869, while on duty in a tugboat, his right hand was caught between the main bearing and the eccentric cam, causing fracture of the distal extremity of the first phalanx of the index finger, with laceration of the soft parts. He was seen within two hours after the accident by Mr. G. L. Wilkins. Complained of severe pain, which made him extremely restless. Ordered proper dressings to the finger, and an anodyne to alleviate the pain, which, however, was still distressing, and continued with more or less severity for three days.

From the 10th to the 19th Sept. he was absent from the city, and during this time he was careless about his injury. At the latter date he first observed stiffness of the muscles of the lower jaw. Was seen on the 20th, when he had rigidity of the jaw, neck, back, and extremities, coupled with a sensation, when walking, "as if his feet did not touch the floor;" countenance anxious and restless; finger has assumed a healthful appearance. The case was now yielded to Dr. W. H. Dwinelle, who ordered a half grain of sulphate of morphia every two hours.

21st. Rigidity has increased, and invaded the whole muscular system; risus sardonicus and slight opisthotonos; tetanic spasms about every twenty minutes; urine retained; pulse 100; great heat of surface. Morphia was ordered, and catheterism to relieve the bladder.

23d. All of the symptoms increased in intensity. Spasms recur about every seven minutes; opisthotonos more marked; deglutition difficult; jaw nearly fixed; constipation obstinate; and perspiration profuse. Morphia continued, and croton oil in fluid extract of senna to relieve the bowels. The finger, looking ill, was amputated, and with it the metacarpal head; the stump dressed with belladonna ointment. Prof. C. Johnston called in consultation. Patient ordered ℞.—Coniæ ♏iv; acid. sulph. dil. ♏ij; aquæ ℥ij: of this twenty drops, used hypodermically, every three hours, beginning at 1 A. M. of the 24th, when the morphia was discontinued.

24th. No appreciable change; pulse averaged 96; spasms about fifteen minutes interval. Ordered solution of conia ♏viij to water ℥ij; 10 drops to be given hypodermically every two hours. ($\frac{1}{3}$ drop.)

25th. The last remedy increased to fifteen drops every hour. ($\frac{2}{3}$ drop.)

96th. Conia, one drop in five drops of water, hypodermically every hour.

27th. Same solution of conia increased to seven drops every hour.

28th. Condition of the patient greatly improved; whole muscular system becoming relaxed, and deglutition easier; pulse 72. At 7 P.M. the solution of conia was increased to ten drops hourly. Throughout the day the spasms averaged about three in each hour.

24th. Catheterism unnecessary; pulse 68; spasms about every half hour. During the day ten drops of the solution of conia every hour. At 7 P. M., in consequence of the feeble tone of the pulse, the interval of the conia extended from one to two hours. Beef essence and brandy. It is, however, to be understood, that the patient was well supported throughout the attack.

30th. Muscular system much relaxed; opisthotonos disappearing, and the lateral motions of the neck are resumed; pulse 68; tone feeble. The depression of the heart's action continuing, the dose of the solution of conia was reduced to five drops every two hours, and the stimulants were persevered in.

Oct. 1. Pulse 80, and fuller; slight spasms every ten minutes. In the afternoon tetanic spasms reappeared in great violence, and recurred about every five minutes. To illustrate the decidedly controlling effect of the conia, it is sufficient to say that at 4 P. M. the dose of the alkaloid was increased from one drop to two drops every hour. By 5 o'clock the interval of the spasms was lengthened to fifteen minutes.

2d. Pulse 80, and good in tone. In the night spasms about every half hour; and during the entire day but three occurred. In addition to the conia, bromide of potassium was given in ten grain doses from this time, but at intervals of three hours.

3d. Slight spasms in the night, recurring about every twenty minutes. Pulse 80. Treatment continued. Conia every two hours.

5th. Improvement general; pulse 80. The night was passed *without any spasm.* Conia one drop every three hours.

6th. Pulse 84. Several spasms during the night of the 5th; rigidity disappearing. Conia continued. Bromide discontinued.

7th. Spasms about every hour during the past night. Conia every five hours. From this date until the 12th the spasms recurred about four times in the twenty-four hours; pulse 84.

13th. Conia suspended.

26th. No spasms since the 12th; no rigidity; pulse 76, of good tone; stump cicatrizing. Patient discharged cured.

While in use, the conia was continued unremittingly *night* and *day.* A greater diminution in the frequency of the spasms was observed in a given period of time after the exhibition of the conia than in a corresponding period before the next dose.

From the 25th Sept. to the 13th October morphia, to relieve pain, was given every three hours. From the 13th to the 26th October it was used successively every three, four, five, and six hours. On the 26th all treatment was suspended. Catheterism, when necessary, was practised three times a day. The bowels were kept open with ol. tiglii, $\frac{1}{4}$th drop in ext. fluid senna, ℥ij for a dose. The diet was varied and nutritious."

It will be noted that the conia was first employed on the 24th Sept. in doses of $\frac{2}{3}$ of a drop; was increased gradually in amount to 2 drops every hour on the 1st Oct.; and was diminished in quantity until the 13th, when it was discontinued.[1]

Whatever encouragement may be afforded by a review of the foregoing cases, it is our duty to record two fatal ones in which conia was also employed. These four are the only instances in which the writer used the remedy under consideration.

CASE III.—A. B., brakesman, æt. 35. February, 1866, entered the infirmary tetanic, with both feet gangrenous from frost bite. These members were amputated while the patient was anæsthetized by chloroform. The spasms and rigidity not abating, conia was tried hypodermically, with the effect of lessening the intensity of both. But although the dose was increased from $\frac{2}{3}$ of a drop to 1 drop every two hours, the patient died in a seizure on the following day.

For the next case we are indebted to Dr. S. Conrad, Resident Physician in the University Hospital (University of Maryland). The report serves to show how carefully and assiduously the patient was attended.

CASE IV.—" J. R. P., sailor, æt. 25, admitted to University Hospital, March 11th, 1869, for syphilitic ulcers on the shin. Had been exposed to cold and wet four days previously in a storm at sea, and received a trifling injury on the forearm. Eight days after admission complained of stiffness of jaws and 'sore throat.' Tetanic symptoms showed themselves two days afterward—the tenth day after admission, and fourteenth after exposure.

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[1] This patient was unremittingly watched and attended by Messrs. G. L. Wilkins of Baltimore, and W. H. Whitehead of Tarboro, N. C., graduates of the University of Maryland (March 1st, 1870).

Was ordered opium for two days, and good food. 23d. Began treatment by conia, hypodermically, in half drop doses every two hours, day and night, increasing the quantity, first by diminishing the interval to every hour, as the effect wore off, then augmenting the amount gradually until it reached one and a half drops, and repeated every hour. The contraction of pupil, relaxation of spasm, and reduction of pulse, were marked features of the action of the drug. The latter was observed and noted before each injection, and also ten minutes afterward. In an average of 21 observations, the pulse was reduced from 88.7 to 80.7. Respiratory movements and deglutition were rendered freer and easier, permitting more comfortable breathing and the swallowing of food. As the effect of the injection wore off in the intervals, the trismus and opisthotonos returned. Under the influence of the conia the patient often expressed himself much better, and was able to eject the frothy sputa from the throat and take food. A few minutes before the last dose was to have been given—at 12 P. M. of the 25th—patient was seized with violent spasm, in which he died. Duration of case from time of exposure, 18 days. Duration after symptoms were observed, 4 days. Duration after treatment by conia, 2 days."

In this case tetanus first appeared on the 19th Nov., and ended abruptly on the 24th ; but an examination of the notes will, doubtless, corroborate the opinion of Dr. Conrad, that the paroxysms were greatly controlled by the conia, which prolonged the patient's life, although the remedy failed to avert the fatal termination. Let us hope, at the best, that our efforts were in the right direction.

Art. XII.—*Elephantiasis Arabum: Amputation of Left Thigh at Junction of Upper with Middle Third.* By Isaac Smith, Jr., A. M., M. D., late Asst. Surg. 26th Regt. Mass. Vols., &c. (With a wood-cut.)

Elephas is so rare in this country, and has been observed by comparatively so few of the profession, that I feel it my duty to report the following interesting case, though the result of the operation was fatal:—

Mrs. J. G., widow, æt. 50, born in England, of English stock, emigrated to this country about twenty years ago and settled in Fall River, where, and in its neighbourhood, she has since resided. She was the mother of nine children, five of whom are still living in this city and in good health, two died in England and two in this country. None of her ancestors, so far as she was aware, ever had any constitutional disease. Her mother completing such an "hawful age" (as she was pleased to express it) that the fact of her longevity was made public in the daily journals of the day. She had never been afflicted with varix in any form. In her pregnancies nothing unusual occurred except with her last two babes, when considerable swelling of the left leg supervened, but which passed away kindly without treatment after labour. She had her men-